LOHNES AND CULVER
CONSULTING RADIO ENGINEERS

WASHINGTON, D.C. 20005

EXHIBIT E
ENGINEERING STATEMENT
PARTIAL PROOF OF PERFORMANCE
KBCQ 50 kW-U, DA-2 1020 kHz
ROSWELL, NEW MEXICO

INDEX

Lohnes and Culver

Washington, D. C.

November, 1979

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INTRODUCTION

This engineering statement was prepared on behalf of Berrendo Broadcasting Company, licensee of standard broadcast station KBCQ, 50 kW-U, DA-2, 1020 kHz, Roswell, New Mexico. KBCQ was authorized by the Commission on November 17, 1977 to conduct program tests with changed facilities in accordance with BP-19646, as modified, pending further action on an application for license. A set of operating specifications was issued on November 25, 1977 along with a request that all operating parameters, including monitoring point values, be read daily for a 30-day period and submitted to the Commission as supplemental data to the pending application for license. Prior to the submission of that data to the Commission the KBCQ nighttime directional antenna was affected by several changes that influenced the operation of the system and necessitated further adjustment work. That adjustment work has been completed and a partial proof of performance has been carried out. The results of the partial proof are attached to this statement and are submitted along with Section II-A of FCC Form 302 in support of an amendment to the pending KBCQ license application. The partial proof of performance is also submitted in response to construction permit BP-780807AP, granted October 16, 1979 authorizing new MEOV's on the KBCQ nighttime horizontal radiation pattern.

DEVELOPMENTS AFFECTING NIGHTTIME DIRECTIONAL ANTENNA

Lightning destroyed a coupling capacitor at the No. 2 tower in the

nighttime phasing system, which had to be replaced. An unstable condition resulted from water penetrating the outer jacket of the sample lines and working its way into the connectors. The No. 2 sampling line shorted at the tower base and there was intermittent arcing at a base current meter switch.

The sampling line connections were opened, cleaned and resealed, additional bonds were made between the sampling line outer conductor and the tower feeders. Spacers were added to the base current meters to increase the spacing between the contacts and one side of the meter was wired directly to the tower matching network output line to prevent corona. A coil was shunted across the input of the night T-networks feeding the No. 3 tower to secure a better line match. All half-inch heliax sampling lines were terminated at feed-through terminals on top of the antenna monitor cabinet and four-foot jumpers were run from these feed through terminals to the six antenna monitor inputs.

Following this corrective action a partial proof of performance was being carried out to establish compliance with the construction permit and to establish new operating parameters, but the work was interrupted by the construction of a water tank 0.8 mile from the antenna system at a bearing of 314° True, which created some distortion in the nighttime pattern. The water tank is a spheroid-shaped dome mounted on top of a 100-foot tubular steel column 10 feet in diameter, supported on an expanded conical base. Four No. 6 alumaweld down-leads were bolted on the underside of the spheroid dome 18 inches away from the vertical column, uniformly spaced around the column. Each down-lead is supported on 18-inch stand-off insulators spaced 10 feet apart along the column. The leads terminate at detuning boxes

seven feet above the ground and are connected in series with variable vacuum condensers to the tower at this point. Each of the down-leads are tuned with the capacitor for minimum reradiation of the KBCQ signal.

It was also discovered that the operation of standard broadcast station KBIM located 2.25 miles from KBCQ at a bearing of 223° True was affecting the field intensity at the KBCQ monitoring points when KBIM switched from non-DA day to DA-N operation. To eliminate this problem pass-reject filters were installed in the KBIM antennas between the matching network and the towers. After the filter circuits were installed and tuned a partial proof of performance was carried out on KBIM, the results of which are being filed as a separate document.

After completion of all of the repairs and adjustments described above the KBCQ nighttime directional antenna was retuned and a partial proof of performance was carried out.

ANTENNA CONSTANTS AND IMPEDANCE DATA

As a result of the necessary readjustment of the KBCQ nighttime directional antenna new operating parameters have been established. The non-critical daytime directional operation was unaffected, therefore the day operating parameters remain unchanged. Figure 1 attached is a tabulation listing the theoretical specifications for both day and night directional antennas along with the authorized daytime operating parameters and the new nighttime operating parameters.

Common point impedance measurements were made on the KBCQ DA-N operation in 5 kHz steps over a ±30 kHz range about the KBCQ operating frequency

of 1020 kHz. Impedance measurements were also made on the No. 2 tower, which is used for non-DA test operation. The resulting data are tabulated and plotted on the graphs of Figures 2 and 3 attached to this statement. The impedance measurements were made with a General Radio 1606A RF bridge that was calibrated against a standard resistor at the time of use. The driver/detector unit was a Potomac Instruments SD/RX 31 frequency synthesizer/detector.

FIELD INTENSITY DATA

Field intensity measurements were made at 10 or more locations on each of the 13 radials measured during the 1977 complete proof of performance. The field intensity data along with the dates and times the measurements were made are tabulated on Figure 4. The values of field intensity are compared to the values measured at the same locations during the 1977 proof on the tabulation of Figure 5. The tabulations of Figure 5 are computer print-outs listing the individual and average arithmetic and geometric mean ratios of the data and the calculated radiated field in each direction, as determined by applying the average ratio to the radiated fields established by the last complete proof of performance of the KBCQ nighttime directional antenna.

Figure 6 is a tabulation listing the radiation in each direction as determined by the partial proof of performance along with the maximum allowable values of radiation including the seven values specified in construction permit BP-780807AP.

All of the field intensity and impedance measurements were made under the direction of the undersigned by Charles H. Smith, whose affidavit is attached and Robert Schulz, Chief Engineer of KBCQ.

Respectfully submitted,

LOHNES AND CULVER

By Frederick D. Veihmeyer
Frederick D. Veihmeyer

District of Columbia)
) ss:
City of Washington)

FREDERICK D. VEIHMEYER, after being duly sworn, on oath deposes and says that he is a radio engineer, a partner in the firm of Lohnes and Culver, Washington, D. C.;

That he has been engaged since 1950 in the practice of radio engineering with the firm of Lohnes and Culver; that his qualifications are a matter of record with the Federal Communications Commission;

That the measurements, calculations and exhibits contained in the attached engineering report and/or statement, or attached hereto, were made by him personally or under his personal supervision and direction, he has personally examined and verified same;

That all of the facts and data included in or attached to the foregoing engineering report and/or statement are true and correct of deponent's personal knowledge unless otherwise stated herein, and any statements shown as being made on information and belief are believed by deponent to be true and correct as herein appearing.

Frederick D. Veihmeyer

Sworn to and subscribed before me, this the 4th day of December

A.D., 1979 .

(Notary Public)

My Commission expires April 14, 1983

District of Columbia)
) ss:
City of Washington)

CHARLES H. SMITH, being sworn before me, says that he was employed by Lohnes and Culver, Consulting Engineers, with offices at 1156 15th St. N. W. Washington, D. C. 20005, to adjust and measure the KBCQ directional antenna system;

That his qualifications are a matter of record with the Federal Communications Commission;

That he adjusted and measured the antenna system as described herein, assisted with and supervised the making of field measurements, and assisted in the preparation of this report;

And that, to the best of his knowledge, the data presented herein is true and accurate.

Charles H. Smith

Sworn to and subscribed before me, this the 3 day of December, A. D., 1979.

(Notary Public)

My Commission expires April 14, 1983

FIGURE 1
ANTENNA CONSTANTS
BERRENDO BROADCASTING COMPANY
KBCQ 50 kW-U, DA-2 1020 kHz
ROSWELL, NEW MEXICO

THEORETICAL SPECIFICATIONS

	Tower	NW(#1)	NC(#2)	NE(#3)	SW(#4)	SC(#5)	SE(#6)
PHASE:	Night	-158.84°	-110.35°	-61.8°	-48°	0°	+48°
	Day	-50.5°	+9.3°	+50.5°	-	-	-
FIELD RATIO:	Night	.2263	.45	.2263	.5029	1.0	.5029
	Day	1.0	2.005	1.0	-	-	-

OPERATING CONSTANTS - November, 1979

PHASE:	Night	-158.5°	-109.5°	-63.8°	-45.3°	0°	+43.5°
	Day	-56°	0°	+41.2°	-	-	-
Sample Current:	Night	.232	.491	.223	.495	1.000	.456
Ratio:	Deviation	0%	0%	0%	0%	0%	0%
Attenuator Setting:	Night	25.22	11.64	26.01	11.52	5.68	12.48
Base Current:	Night	4.5 A	9.3	5.35	11.1	21.2	10.0
Base Current Ratio:		.212	.439	.252	.524	1.000	.472
Common Point:	32.4 Amperes						
Sample Current	Day	.500	1.0	.500			
Ratio:	Deviation	0%	0%	0%			
Attenuator Setting:	Day	10.02	4.92	9.84			
Base Current	Day	12.3 A	23.5	13.3			
Base Current Ratio		.523	1.0	.566			
Common point:	32.4 Amperes						

Prepared by

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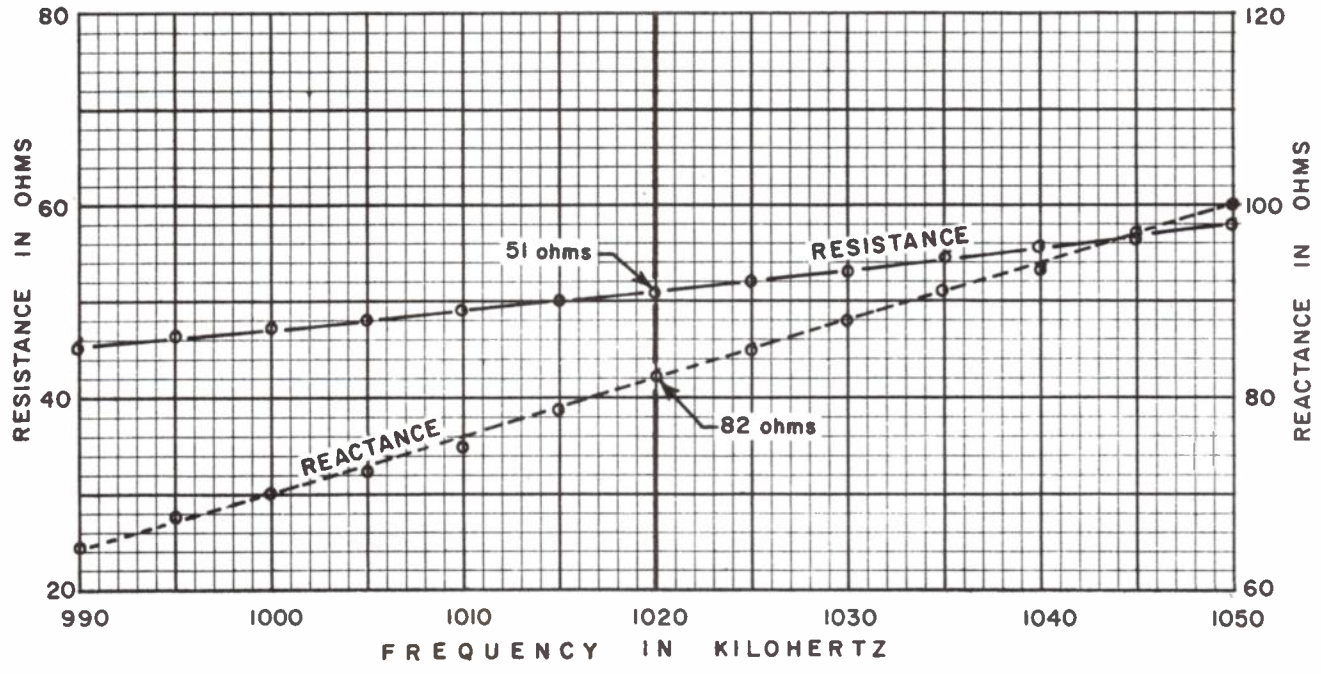
November, 1979



Frequency (kHz)	Resistance (Ohms)	Reactance (Ohms)
990	45.25	¡ 64.5
995	46.25	¡ 67.5
1000	47	¡ 70
1005	48	¡ 72.5
1010	49	¡ 75
1015	50	¡ 79
1020	51	¡ 82
1025	52	¡ 85
1030	53	¡ 88
1035	54.5	¡ 91
1040	55.5	¡ 93
1045	56.5	¡ 97
1050	58	¡ 100

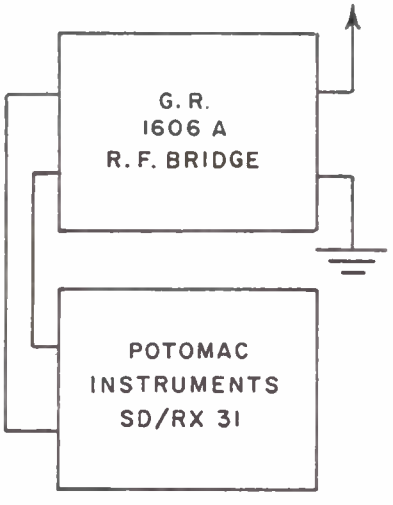


FIGURE 2
NON-DIRECTIONAL ANTENNA IMPEDANCE
TOWER NO. 2
BERRENDO BROADCASTING COMPANY
KBCQ 50 kW-U, DA-2 1020 kHz
ROSWELL, NEW MEXICO

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FIGURE 4
PARTIAL PROOF OF PERFORMANCE
NIGHTTIME FIELD INTENSITY MEASUREMENTS
BERRENDO BROADCASTING COMPANY
KBCQ 50 kW-U, DA-2 1020 kHz
ROSWELL, NEW MEXICO

RADIAL N 30° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
16	2.75	3.4 mV/m	10-23-79	3:10	12.5 mV/m
17	3.4	10.0	"	3:14	17.5
18	5.8	9.6	"	3:29	14
19	6.35	8.8	"	3:25	13.5
20	7.4	6.7	"	3:44	10.0
21	8.2	6.6	"	3:55	8.5
22	13.3	4.1	"	4:40	5.0
23	14.6	2.05	"	4:52	2.8
24	15.6	1.3	"	4:58	1.85
25	17.3	1.45	"	5:24	1.85

RADIAL N 40° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
18	2.13	6.0 mV/m	10-19-79	9:10	21 mV/m
19	2.9	4.0	"	9:20	11.5
20	5.0	2.7	"	9:35	6.5
21 MP	6.0	2.0	"	9:42	5.2
22	6.5	2.5	"	9:47	7.5
23	7.25	4.2	"	10:03	7.0
24	8.0	2.3	"	10:15	2.55
25	8.8	2.4	"	10:22	1.35
26	10.1	2.0	"	10:32	2.2
27	13.4	.95	"	11:20	.5
28	15.2	.6	"	11:01	.87
29	16.7	.6	"	11:40	.9
30	18.8	1.0	"	11:51	1.0

FIGURE 4 (Continued)

RADIAL N 60° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
18	2.5	19 mV/m	10-19-79	1:30	6.0 mV/m
19	3.08	12	"	1:32	8.5
20 MP	3.65	4.3	"	1:37	5.0
21	4.16	5.7	"	1:41	2.0
22	4.7	7.2	"	1:46	4.6
24	6.0	4.1	"	1:54	6.0
25	7.5	3.9	"	2:04	7.0
26	10.6	3.4	"	3:24	1.3
27	12	1.4	"	3:15	1.1
28	14.3	.43	"	2:39	2.5
29	15.8	.35	"	2:49	2.0

RADIAL N 73° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
23	2.7	7.5	10-19-79	6:13	6.0
24	2.84	4.4	"	6:07	2.0
25 MP	3.07	8.5	"	6:05	7.0
26	3.3	7.3	"	6:03	9.0
27	4.33	4.25	"	5:45	2.3
28	4.64	4.2	"	5:39	4.5
29	4.9	5.5	"	5:37	7.2
30	6.05	2.75	"	5:33	2.2
31	6.3	1.3	"	5:23	2.3
32	6.9	2.75	"	5:27	2.5
34	10.1	5.2	"	3:37	2.7
35	11.3	1.25	"	3:45	2.9
36	12.5	2.25	"	3:53	2.1

FIGURE 4 (Continued)

RADIAL N 89° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
28	4.75	2.3 mV/m	10-19-79	5:59	5.2 mV/m
29 MP	4.95	2.8	"	5:55	3.6
30	5.06	3.2	"	5:49	4.0
31	5.3	4.2	"	5:51	3.7
32	5.9	7.7	"	5:18	4.3
33	6.6	1.8	"	5:10	5.5
34	8.9	3.4	"	4:33	6.2
35	10.8	5.0	"	4:25	4.0
36	12.4	3.75	"	4:14	1.55
37	13.3	3.7	"	4:08	3.4

RADIAL N 130° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
16	2.08	124 mV/m	10-20-79	11:00	138 mV/m
17 MP	2.2	118	"	10:57	135
18	3.5	75	"	11:07	80
19	4.38	59	"	11:11	68
20	6.45	65	"	11:34	64
21	7.3	46	"	11:18	46
22	7.75	50	"	11:40	50
23	9.00	35	"	11:50	35
24	11.00	29	"	12:01	30
25	12.2	33.5	"	12:06	39
26	12.6	37	"	12:09	35
27	13.7	28.7	"	2:29	26
28	14.8	23.5	"	2:49	23

FIGURE 4 (Continued)

RADIAL N 145° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
17	3.0	305 mV/m	10-22-79	10:25	300 mV/m
18	4.0	238	"	10:30	235
19	4.8	210	"	10:43	215
20	5.9	170	"	10:49	165
21	7.1	135	"	10:54	145
22	7.45	129	"	10:59	132
23	7.75	115	"	11:04	125
24	8.96	108	"	11:10	124
25	9.85	105	"	11:18	100
26	10.9	83	"	11:24	78
27	11.4	92	"	11:37	90
29	16.0	58	"	11:05	56
30	17.8	49	"	12:57	48
31	20	46	"	12:48	40

RADIAL N 174° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
16	3.38	730 mV/m	10-22-79	3:36	700 mV/m
17	3.62	700	"	3:39	700
18	3.85	622	"	3:42	650
19	4.82	525	"	3:50	480
20	5.11	510	"	3:52	475
21	5.40	445	"	3:55	500
22	5.9	418	"	3:59	410
23	6.6	410	"	4:07	440
24	7.4	320	"	4:13	325
25	7.95	305	"	4:17	285
26	8.95	252	"	4:23	250

FIGURE 4 (Continued)

RADIAL N 223° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
12	2.13	930 mV/m	10-22-79	5:28	730 mV/m
13	2.5	540	"	5:24	495
14	3.2	440	"	5:19	380
15	3.5	390	"	5:17	420
16	3.9	320	"	5:15	350
17	5.08	255	"	5:11	285
18	6.0	238	"	5:07	220
19	6.74	195	"	5:01	195
20	7.4	162	"	4:57	150
21	8.2	152	"	4:48	145
22	9.1	123	"	4:51	130

RADIAL N 240° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
15	2.72	400 mV/m	10-22-79	8:43	400
16	2.95	390	"	8:45	385
17	3.7	265	"	8:52	235
18 MP	4.0	289 2.245 Or proof	"	8:57	289
20	5.2	152	"	9:03	158
21	5.75	169	"	9:07	170
22	6.4	168	"	9:11	172
23	7.25	139	"	9:18	128
24	8.15	107	"	9:23	105
25	9.7	78	"	9:28	80
26	11.7	62	"	9:37	68

FIGURE 4 (Continued)

RADIAL N 279° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
15	2.45	230 mV/m	10-23-79	8:30	250 mV/m
16	3.5	160	"	8:46	170
17 MP	4.15	155	"	8:51	170
18	4.52	115	"	8:55	130
19	5.75	86	"	9:07	95
20	6.95	71	"	9:24	75
21	8.45	42	"	9:44	48
22	10.3	28.5	"	10:00	31
23	10.9	31	"	10:06	34
24	13.6	18.5	"	10:15	18.5
25	16	14	"	10:23	16
26	19	10	"	10:42	9.5

RADIAL N 314° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
16	2.3	910 mV/m	10-23-79	11:40	890
17	3.08	710	"	11:45	710
18	4.25	540	"	11:59	520
19	4.65	500	"	12:03	465
20	5.22	390	"	12:17	400
21	6.7	315	"	12:27	315
23	8.9	205	"	12:41	200
24	10.3	166	"	12:48	175
25	11.8	105	"	12:55	100
26	13.5	72	"	1:03	71
27	15.6	57	"	1:15	52

FIGURE 4 (Continued)

RADIAL N 350° E

Loc. No.	Dist. Miles	1977 DA-N	1979 Date	Local Time	1979 DA-N
20	3.3	325 mV/m	10-23-79	2:22	300 mV/m
21	3.7	268	"	2:20	270
22	4.4	250	"	2:11	210
23	3.05	185	"	2:08	170
24	5.35	187	"	2:05	182
25	6.05	170	"	2:00	172
26	6.67	120	"	1:57	155
27	7.6	130	"	1:53	115
28	9.15	90	"	1:49	89
29	9.95	97	"	1:45	90
30	10.8	87	"	1:38	85

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Washington, D. C.

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FIGURE 5
FIELD INTENSITY RATIOS
BERRENDO BROADCASTING COMPANY
KBCQ 50 kW-U, DA-2 1020 kHz
ROSWELL, NEW MEXICO

TRUE BEARING = 30 DEGREES
1977 DA-N RADIATION = 29.9 MV/M
NO. OF POINTS = 10
FIRST POINT IS 16

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
16	12.5	3.4	3.676	2.565
17	17.5	10	1.750	2.243
18	14	9.6	1.458	2.164
19	13.5	8.8	1.534	2.186
20	10	6.7	1.492	2.174
21	8.5	6.6	1.288	2.110
22	5	4.1	1.220	2.086
23	2.8	2.05	1.366	2.135
24	1.85	1.3	1.423	2.153
25	1.85	1.45	1.276	2.106

ARITHMETIC MEAN RATIO = 1.648
ARITHMETIC MEAN = 49.286 MV/M

GEO MEAN RATIO = 1.557
GEOMETRIC MEAN = 46.551 MV/M

TRUE BEARING = 40 DEGREES
1977 DA-N RADIATION = 16.9 MV/M
NO. OF POINTS = 13
FIRST POINT IS 18

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
18	21	6	3.500	2.544
19	11.5	4	2.875	2.459
20	6.5	2.7	2.407	2.382
21	5.2	2	2.600	2.415
22	7.5	2.5	3.000	2.477
23	7	4.2	1.667	2.222
24	2.55	2.3	1.109	2.045
25	1.35	2.4	0.563	1.750
26	2.2	2	1.100	2.041
27	0.5	0.95	0.526	1.721
28	0.87	0.6	1.450	2.161
29	0.9	0.6	1.500	2.176
30	1	1	1.000	2.000

ARITHMETIC MEAN RATIO = 1.792
ARITHMETIC MEAN = 30.286 MV/M

GEO MEAN RATIO = 1.528
GEOMETRIC MEAN = 25.821 MV/M

FIGURE 5 (Cont'd.)

TRUE BEARING = 60 DEGREES
1977 DA-N RADIATION = 21.7 MV/M
NO. OF POINTS = 11
FIRST POINT IS 1

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
18	6	19	0.316	1.499
19	8.5	12	0.708	1.850
20	5	4.3	1.163	2.066
21	2	5.7	0.351	1.545
22	4.6	7.2	0.639	1.805
24	6	4.1	1.463	2.165
25	7	3.9	1.795	2.254
26	1.3	3.4	0.382	1.582
27	1.1	1.4	0.786	1.895
28	2.5	0.43	5.814	2.764
29	2	0.35	5.714	2.757

ARITHMETIC MEAN RATIO = 1.739
ARITHMETIC MEAN = 37.741 MV/M

GEO MEAN RATIO = 1.039
GEOMETRIC MEAN = 22.553 MV/M

TRUE BEARING = 73 DEGREES
1977 DA-N RADIATION = 21.9 MV/M
NO. OF POINTS = 13
FIRST POINT IS 1

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
23	6	7.5	0.800	1.903
24	2	4.4	0.455	1.658
25	7	8.5	0.824	1.916
26	9	7.3	1.233	2.091
27	2.3	4.25	0.541	1.733
28	4.5	4.2	1.071	2.030
29	7.2	5.5	1.309	2.117
30	2.2	2.75	0.800	1.903
31	2.3	1.3	1.769	2.248
32	2.5	2.75	0.909	1.959
34	2.7	5.2	0.519	1.715
35	2.9	1.25	2.320	2.365
36	2.1	2.25	0.933	1.970

ARITHMETIC MEAN RATIO = 1.037
ARITHMETIC MEAN = 22.715 MV/M

GEO MEAN RATIO = 0.933
GEOMETRIC MEAN = 20.431 MV/M

FIGURE 5 (Cont'd.)

TRUE BEARING = 89 DEGREES
1977 DA-N RADIATION = 19.6 MV/M
NO. OF POINTS = 10
FIRST POINT IS 28

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
28	5.2	2.3	2.261	2.354
29	3.6	2.8	1.286	2.109
30	4	3.2	1.250	2.097
31	3.7	4.2	0.881	1.945
32	4.3	7.7	0.558	1.747
33	5.5	1.8	3.056	2.485
34	6.2	3.4	1.824	2.261
35	4	5	0.800	1.903
36	1.55	3.75	0.413	1.616
37	3.4	3.7	0.919	1.963

ARITHMETIC MEAN RATIO = 1.325
ARITHMETIC MEAN = 25.965 MV/M

GEO MEAN RATIO = 1.117
GEOMETRIC MEAN = 21.895 MV/M

TRUE BEARING = 130 DEGREES
1977 DA-N RADIATION = 371 MV/M
NO. OF POINTS = 13
FIRST POINT IS 16

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
16	138	124	1.113	2.046
17	135	118	1.144	2.058
18	80	75	1.067	2.028
19	68	59	1.153	2.062
20	64	65	0.985	1.993
21	46	46	1.000	2.000
22	50	50	1.000	2.000
23	35	35	1.000	2.000
24	30	29	1.034	2.015
25	39	33.5	1.164	2.066
26	35	37	0.946	1.976
27	26	28.7	0.906	1.957
28	23	23.5	0.979	1.991

ARITHMETIC MEAN RATIO = 1.038
ARITHMETIC MEAN = 384.984 MV/M

GEO MEAN RATIO = 1.035
GEOMETRIC MEAN = 383.848 MV/M

FIGURE 5 (Cont'd.)

TRUE BEARING = 145 DEGREES
1977 DA-N RADIATION = 1001 MV/M
NO. OF POINTS = 14
FIRST POINT IS 1

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
17	300	305	0.984	1.993
18	235	238	0.987	1.994
19	215	210	1.024	2.010
20	165	170	0.971	1.987
21	145	135	1.074	2.031
22	132	129	1.023	2.010
23	125	115	1.087	2.036
24	124	108	1.148	2.060
25	100	105	0.952	1.979
26	78	83	0.940	1.973
27	90	92	0.978	1.990
29	56	58	0.966	1.985
30	48	49	0.980	1.991
31	40	46	0.870	1.939

ARITHMETIC MEAN RATIO = 0.999
ARITHMETIC MEAN = 999.775 MV/M

GEO MEAN RATIO = 0.997
GEOMETRIC MEAN = 997.576 MV/M

TRUE BEARING = 174 DEGREES
1977 DA-N RADIATION = 2683 MV/M
NO. OF POINTS = 11
FIRST POINT IS 16

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
16	700	730	0.959	1.982
17	700	700	1.000	2.000
18	650	622	1.045	2.019
19	480	525	0.914	1.961
20	475	510	0.931	1.969
21	500	445	1.124	2.051
22	410	418	0.981	1.992
23	440	410	1.073	2.031
24	325	320	1.016	2.007
25	285	305	0.934	1.971
26	250	252	0.992	1.997

ARITHMETIC MEAN RATIO = 0.997
ARITHMETIC MEAN = 2675.512 MV/M

GEO MEAN RATIO = 0.995
GEOMETRIC MEAN = 2670.561 MV/M

FIGURE 5 (Cont'd.)

TRUE BEARING = 223 DEGREES
1977 DA-N RADIATION = 1544 MV/M
NO. OF POINTS = 11
FIRST POINT IS 12

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
12	730	930	0.785	1.895
13	495	540	0.917	1.962
14	380	440	0.864	1.936
15	420	390	1.077	2.032
16	350	320	1.094	2.039
17	285	255	1.118	2.048
18	220	238	0.924	1.966
19	195	195	1.000	2.000
20	150	162	0.926	1.967
21	145	152	0.954	1.980
22	130	123	1.057	2.024

ARITHMETIC MEAN RATIO = 0.974
ARITHMETIC MEAN = 1503.956 MV/M

GEO MEAN RATIO = 0.969
GEOMETRIC MEAN = 1495.888 MV/M

TRUE BEARING = 240 DEGREES
1977 DA-N RADIATION = 1249 MV/M
NO. OF POINTS = 11
FIRST POINT IS 1

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
15	400	400	1.000	2.000
16	385	390	0.987	1.994
17	235	265	0.887	1.948
18	289	289	1.000	2.000
20	158	152	1.039	2.017
21	170	169	1.006	2.003
22	172	168	1.024	2.010
23	128	139	0.921	1.964
24	105	107	0.981	1.992
25	80	78	1.026	2.011
26	68	62	1.097	2.040

ARITHMETIC MEAN RATIO = 0.997
ARITHMETIC MEAN = 1245.336 MV/M

GEO MEAN RATIO = 0.996
GEOMETRIC MEAN = 1243.499 MV/M

FIGURE 5 (Cont'd.)

TRUE BEARING = 279 DEGREES
1977 DA-N RADIATION = 610 MV/M
NO. OF POINTS = 12
FIRST POINT IS 15

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
15	250	230	1.087	2.036
16	170	160	1.063	2.026
17	170	155	1.097	2.040
18	130	115	1.130	2.053
19	95	86	1.105	2.043
20	75	71	1.056	2.024
21	48	42	1.143	2.058
22	31	28.5	1.088	2.037
23	34	31	1.097	2.040
24	18.5	18.5	1.000	2.000
25	16	14	1.143	2.058
26	9.5	10	0.950	1.978

ARITHMETIC MEAN RATIO = 1.080
ARITHMETIC MEAN = 658.689 MV/M

GEO MEAN RATIO = 1.078
GEOMETRIC MEAN = 657.811 MV/M

TRUE BEARING = 314 DEGREES
1977 DA-N RADIATION = 2548 MV/M
NO. OF POINTS = 11
FIRST POINT IS 1

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
16	890	910	0.978	1.990
17	710	710	1.000	2.000
18	520	540	0.963	1.984
19	465	500	0.930	1.968
20	400	390	1.026	2.011
21	315	315	1.000	2.000
23	200	205	0.976	1.989
24	175	166	1.054	2.023
25	100	105	0.952	1.979
26	71	72	0.986	1.994
27	52	57	0.912	1.960

ARITHMETIC MEAN RATIO = 0.980
ARITHMETIC MEAN = 2496.394 MV/M

GEO MEAN RATIO = 0.979
GEOMETRIC MEAN = 2494.436 MV/M

FIGURE 5 (Cont'd.)

TRUE BEARING = 350 DEGREES
1977 DA-N RADIATION = 1106 MV/M
NO. OF POINTS = 11
FIRST POINT IS 20

POINT	'79 DA-N	'77 DA-N	1979/1977	LOG 100R
20	300	325	0.923	1.965
21	270	268	1.007	2.003
22	210	250	0.840	1.924
23	170	185	0.919	1.963
24	182	187	0.973	1.988
25	172	170	1.012	2.005
26	155	120	1.292	2.111
27	115	130	0.885	1.947
28	89	90	0.989	1.995
29	90	97	0.928	1.967
30	85	87	0.977	1.990

ARITHMETIC MEAN RATIO = 0.977
ARITHMETIC MEAN = 1080.309 MV/M

GEO MEAN RATIO = 0.971
GEOMETRIC MEAN = 1074.002 MV/M

FIGURE 6
MEASURED RADIATION VALUES
CP AND MEOV VALUES
BERRENDO BROADCASTING COMPANY
KBCQ 50 kW-U, DA-2 1020 kHz
ROSWELL, NEW MEXICO

Bearing	1977 Measured Radiation	Ratio 1979/1977	1979 Measured Radiation	MEOV and CP Values
N 30° E	29.9 mV/m	1.557	46.6 mV/m	57 mV/m
40°	16.9	1.528	25.8	30*
60°	21.7	1.039	22.6	25.5*
73°	21.9	.933	20.4	26.0*
89°	19.6	1.117	21.9	35*
130°	371	1.035	384	400*
145°	1001	1.998	998	1025
174°	2683	.995	2671	2760
223°	1544	.969	1496	1620
240°	1249	.996	1243	1350*
279°	610	1.078	658	680*
314°	2548	.979	2494	2730
350°	1106	.971	1074	1145

*CP Values

Prepared by

Lohnes and Culver — Washington, D. C.

November, 1979

Broadcast Application | FEDERAL COMMUNICATIONS COMMISSION | Section II-A

LICENSE APPLICATION ENGINEERING DATA STANDARD BROADCAST

Name of applicant: Berrendo Broadcasting Company

Purpose of authorization applied for: (Check one)

	Answer paragraphs
[X] Station license	1-13
[ ] Direct measurement of power	2,6,7,8,9,14

1. Facilities authorized in construction permit

Call Sign	File No. of construction permit
KBCQ	BP19646 & BP-780807AP

Frequency	Hours of operation	Power in kilowatts	
		Night	Day
1020	Unlimited	50	50

2. Station location

State	City or town
New Mexico	Roswell

3. Transmitter location

State	County
New Mexico	Chaves
City or Town	**Street Address (or other identification)**
Roswell	Old Roswell Clovis Hgy.

4. Main studio location: Same as transmitter

State	County
New Mexico	Chaves
City or Town	**Street and number**
Roswell	Old Roswell Clovis Hgy.

5. Remote control point location (only if authorized): NA

State	City or town
-	-

Street Address (or other identification): -

6. Transmitter Installed

Make	Type No.	Rated Power
RCA	BTA-50H	50 kW

Last radio stage

	Total unmodulated plate current	Plate voltage
Night	4.1	15500
Day	4.1	15500

Manufacturer's recommended operating efficiency for the last radio frequency amplifier stage in percent: 78 - 85%

Is inverse feedback utilized? Yes [ ] No [ ]
If "Yes", to what value of feedback power is transmitter adjusted (in db)

Efficiency of the last radio frequency amplifier stage as now adjusted (use formula $\frac{I_a^2}{E_p} \frac{R_a (100)\%}{I_p}$)

82.6% day and night

7. Operating constants: (If directional system, give current at point of resistance measurement.)

RF common point or antenna current without modulation for night power in amperes	RF common point or antenna current without modulation for day power in amperes
32.4	32.4
Actual measured antenna or common point resistance (in ohms) at operating frequency	**Actual measured antenna or common point reactance (in ohms) at operating frequency**
Night 50 Day 50	Night 0 Day 0

Currents, and phases for directional operation

Tower	Phase reading in degrees		Antenna base current		Remote indication of antenna current	
	Night	Day	Night	Day	Night	Day
NW 1	-158.5°	-56°	4.5 a	12.3a	.232	.5
NC 2	-109.5	0	9.3	23.5	.491	1.0
NE 3	-63.8	+41.2	5.35	13.3	.223	.5
SW 4	-45.3	-	11.1	-	.495	-
SC 5	0	-	21.2	-	1.000	-
SE 6	+43.5	-	10.0	-	.456	-

Manufacturer and type of antenna monitor:
Potomac Instruments AM-19(204) SN 1338
Potomac Instruments PMA-19 SN 136

Describe equipment used for remote indication of antenna currents (antenna monitor or other method)
Antenna monitor

8. Description of antenna system

(If directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary. Height figures should not include obstruction lighting.)

Type radiator	Height in feet of complete radiator above base insulator, or above base if grounded.
Uniform cross-section guyed steel 6 towers all same	240
Overall height in feet above ground. (without obstruction lighting)	**If antenna is either top loaded or sectionalized, describe fully as EXHIBIT ____.**
244	NA

Excitation: Series [X] Shunt. [ ]

Geographic coordinates to nearest second.
For directional antenna give coordinates of center of array.
For single vertical radiator give tower location.

North latitude	West longitude
33 27 53	104 29 58

If not fully describe above, give further details and dimensions including any other antennas mounted on tower and associated isolation circuits as EXHIBIT ____. On file

Details and dimensions of ground system: (Attach sketch as EXHIBIT ____ if necessary for complete description).

120 radials about each tower, bonded together where they intersect. Radials buried six inches below ground.

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9. Antenna resistance measurement

Attach as Exhibit No. E the following:

a. Qualifications of persons taking measurements.

b. Schematic diagram showing clearly all components of coupling circuits, point of resistance measurement, location of antenna ammeter, connection to and characteristics of all tower lighting isolation circuits, static drains, and any other fixtures, lines etc. connected to or supported by the antenna, including other antennas and associated circuits.

c. Full description of method used to make measurements.

d. Manufacturer's name of each calibrated instrument used and manufacturer's rated accuracy.

e. Date, accuracy, and by whom each instrument was last calibrated.

f. Table of complete data taken.

g. The graph drawn of 10 to 12 readings in a band 50 to 60 kilohertz wide with the operating frequency near the center.

10. Modulation monitor

Make	Type No.
RCA	BW-66F

11. Frequency measurements

Give the following data on the checks of the frequency

	Date and Time	Frequency measured by such agency or method
1.	NA	
2.		
3.		

Name of checking agency or method used

Commercial monitoring service

12. Give method of varying power to compensate for variation of line voltage.

Adjust time phase relationship of output power amplifiers in final stage of RCA ampliphase transmitter

13. In what respect, if any does the apparatus constructed differ from that described in the application for construction permit or in the permit?

NA

14. Give reason for the change in antenna or common point resistance.

No change

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Date December 4, 1979

Signature [signature]

Telephone 202-296-2722
(Include Area Code)

(check appropriate box below)

- [ ] Technical Director
- [ ] Registered Professional Engineer
- [X] Consultant
- [ ] Chief Operator